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3M INNOVATIVE PROPERTIES COMPANY
PO BOX 33427
ST. PAUL, MN 55133-3427

EXAMINER	
HU, HENRY S	

ART UNIT	PAPER NUMBER
1713	

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/627,149	GROOTAERT ET AL.	
	Examiner	Art Unit	
	Henry S. Hu	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *election of September 16, 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 16-19* is/are rejected.

7)☒ Claim(s) *2 and 6* is/are objected to.

8)☒ Claim(s) *1-19* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2 pages*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the election filed on September 16, 2004. **New Claims 16-19** were all dependent from Claim 1 and were drawn to a fluoropolymer produced from microemulsion of parent Claim 1, new claims are therefore **grouped together with Group I**.

Applicant's election of Group I, Claims 1-14 is traversed with remarks on pages 6-7. The traversal is on the ground(s) that it would not place an undue burden to search and examine the non-elected Groups II of parent Claim 15 with Group I since they are so closely related in the field of curable fluoropolymer compositions. This is not found persuasive because each Group is drawn to a technology apparently requiring search in different classification area.

As discussed earlier, the cured polymers may contain any polymer as long as it is containing a cure-site and is compatible with other additives. The microemulsion described in Group I may be used in the form of dispersion or emulsion for other applications. The polymer in Group II may use materially different types of monomers in addition to the liquid cure-site monomer used in Group I, and may contain various additives. Therefore, the scope of the claims, i.e., the metes and boundaries are distinct.

The requirement is still deemed proper and is therefore made FINAL. In summary, this application contains original **Claim 15,** which is drawn to an invention non-elected with traverse. A complete reply to the final rejection must include **cancellation of non-elected claims** or other appropriate action (37 CFR 1.144) See MPEP § 821.01. **Claims 1-19 are pending now, while non-elected Claim 15 is withdrawn from consideration**. An action follows.

Specification

2. The disclosure is objected to because of the following informalities:

(a) On **page 5** at line 23-24, phrase of "Z represents COO^- or SO_3^- M represents" should be changed to "Z represents COO^- or SO_3^-; M represents" since they are different species.

(b) On **page 6** at line 8, recitation of "perfluorofluoorene" should be changed to "**perfluorofluorene**" since it relates to a fluorinated ring compound, **fluorene**.

(c) On **page 13** at line 6, three nitrogen atoms should be on the ring. Otherwise, it becomes an amino group.

(d) On **page 19** at line 20, "comp" should be changed to "**compound**".

(e) On **page 21** at line 9, "perfluoroadipatc" should be changed to "perfluoroadipate" since it is related to a salt of adipic acid. Please refer to page 21 at line 18 for a correct wording.

(f) On **page 21** at line 21 and page 23 at line 10, both recitations of "ammonium-perfluorooctanoate" is improper. It should be changed to "**ammonium perfluorooctanoate**" without using a dash mark. Please refer to page 21 at lines 22-23 and page 22 at line 8 for a correct wording.

Appropriate corrections for (a) - (f) are required.

Claim Objections

3. Claims 2 and 6 are objected to because of the following informalities:

(a) On **Claim 2** at line 5, phrase of "Z represents COO^- or SO_3^- M represents" should be changed to "Z represents COO^- or SO_3^-; M represents".

(b) On **Claim 6** at lines 3-4, the Applicants may need to **regroup** it to "a liquid fluorinated monomer comprising a cure-site and optionally an inert liquid and highly fluorinated hydrocarbon compound" as the statement of Claim 1.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. *The limitation of parent* ***Claim 1*** *of the present invention relates to* ***aqueous microemulsion*** *comprising (A)* ***a perfluorinated alkane sulphonic or carboxylic acid or salt*** *thereof, (B)* ***a liquid fluorinated monomer comprising a cure-site*** *and (C)* ***optionally*** *an inert liquid and highly fluorinated hydrocarbon compound. See other limitations of dependent* ***Claims 2-14 and 16-19.***

6. Claims 1-4, 6-14 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Logothetics et al. (US 4,983,697) or Logothetics et al. (US 4,972,038), each individually in view of Grootaert et al. (US 6,730,760 B2) or Linert et al. (US 6,737,489 B2).

Regarding the limitation of parent **Claim 1**, **Logothetics** et al. in "697" or "038", each individually disclose the preparation of perfluoropolymer by interpolymerization of tetrafluoroethylene, perfluoro(alkyl vinyl ether), and **cyano-containing cure-site monomer such as perfluoro-(8-cyano-5-methyl-3,6-dioxa-1-octene) (8CNVE)**, and further comprising iodo moieties such as perfluoroalkyl iodides (see "696" on abstract, line 1-7; column 4, line 51 – column 5, line 5; see "038" on abstract, line 1-4; column 4, line 48 – column 5, line 3). It is noted that **ammonium perfluoroctanoate** (AFPO) is added to the monomer reaction mixture as an emulsifier so that the process is related to **emulsion polymerization**. It is noted that limitation of "an inert liquid and highly fluorinated hydrocarbon compound" is in optional language.

7. Although the references are using a **liquid** 8CNVE monomer being reading on "liquid fluorinated monomer comprising a cure-site", **Logothetics is silent of starting the polymerization in the form of aqueous microemulsion.** Grootaert or Linert, each teaches in the course of making a curable fluoroelastomer, at least one monomer of perfluorovinyl ether can be pre-emulsified into microemulsion with average droplet size of 20 micron to 150 nm (see "760" on column 4, line 18-30; see "489" on column 10, line 55-57) before copolymerization with other gaseous fluorinated monomer (see "760" on abstract, line 1-8; see "489" on column 10, line 50-63), the advantage is that such a process becomes a substantially faster polymerization process so that a low T_g and desirable physical and mechanical properties can thus be obtained in a convenient and

cost effective way (see "760" on column 2, line 47-56; see "489" on column 10, line 32-49).

8. In light of the fact that **polymeric emulsions or dispersions produced by above references, are containing the same type of fluorinated copolymers, which can be obtained through emulsion polymerization with the presence of the same fluorinated emulsifier**, one having ordinary skill in the art would therefore have found it obvious to **modify Logothetics' emulsion polymerization process by pre-emulsifying the monomers of** perfluoro(alkyl vinyl ether), and **cyano-containing cure-site monomer such as perfluoro-(8-cyano-5-methyl-3,6-dioxa-1-octene) (8CNVE)** to be in the form of microemulsion before copolymerization with other gaseous fluorinated monomer as taught by Grootaert or Linert. By doing so, polymerization process is processed in a substantially faster time so that a low T_g and desirable physical and mechanical properties can thus be obtained in a convenient and cost effective way.

9. Regarding **Claim 4**, a **liquid** 8CNVE monomer with name of "**perfluoro-(8-cyano-5-methyl-3,6-dioxa-1-octene)**" is used by Logothetics. Additionally, "760" has disclosed using a monomer CN31 (see Grootaert on column 10, line 59-60) being reading on the claimed limitation of Claim 4.

Regarding **Claims 9-10**, "760" or "489" each has taught using an initiator from a mixture of perfluorosulfinate (or APS/bisulfite) and an oxidizing agent, the advantage is

such oxidizing agent is water soluble and capable of converting the sulfinate to a sulfonyl moiety, so that an improved processability of fluoroelastomer can be obtained (see Grootaert on column 6, line 1-19; see "489" on column 10, line 14-25).

Regarding **Claims 11-14**, the working examples in all references have disclosed the isolation step to obtain fluoropolymer from aqueous dispersions. Regarding **Claims 12-14**, a cure composition can be effectively prepared by adding curing agent and coagents as disclosed in all references (see "038" at column 3, line 56 – column 4, line 3; see "697" at column 3, line 58 – column 4, line 5; see "760" at column 9, line 61 – column 10, line 12).

Remaining dependent **Claims 2-3, 6-8 and 17-18** are thereby rejected with the same reason for the rejection of Claims 1, 4 and 9-14.

10. Claims 5, 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Logothetics et al. (US 4,983,697) or Logothetics et al. (US 4,972,038), each individually in view of Grootaert et al. (US 6,730,760 B2) or Linert et al. (US 6,737,489 B2) as applied to Claims 1-4, 6-14 and 17-18, and further in view of Tournut et al. (US 4,025,481).

Regarding **Claims 5, 16 and 19**, the above 103(a) rejection for Claims 1-4, 6-14 and 17-18 is incorporated here by reference. The reference is silent about using an inert

liquid and highly fluorinated hydrocarbon compound in the polymerization process. **Tournut** et al teach that liquid halogenated hydrocarbons including a highly fluorinated one such as CF_2ClBr can be added in the emulsion polymerization of fluorinarted monomers, the advantage is such a compound would act as stabilizing agent so that very concentrated dispersions of fluoropolymers can be obtained with good stability and purity (column 2, line 50-68 and 10-30).

11. In light of the fact that **polymeric dispersions produced by above references, are containing the same type of fluorinated polymers or copolymers, which can be obtained through emulsion polymerization with the presence of the same fluorinated emulsifier**, one having ordinary skill in the art would therefore have found it obvious to **modify emulsion polymerization process by adding liquid halogenated hydrocarbons including a highly fluorinated one such as CF_2ClBr** as taught by Tournut. By doing so, very concentrated dispersions of fluoropolymers can be obtained with good stability and purity due to the compound being acted as a stabilizing agent.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to aqueous microemulsion comprising a perfluorinated alkane sulphonic or carboxylic acid or salt thereof, and a liquid fluorinated monomer comprising a cure-site:

US Patent No. 6,429,258 to Morgan et al. disclose that the aqueous dispersion polymerization process to prepare PTFE can be processed in the presence of a combination of fluorosurfactants with one of which is PFPE carboxylic acid or salt (abstract, line 1-3; column 11, line 25-50), as well as some inert and fluorinated compound such as **1,1,2-trichloro-1,2,2-trifluoroethane (R-113)** (column 3, line 10-15). Although fluorinated emulsifier is used, **no claimed pre-emulsifying to microemulsion is disclosed**.

US Patent No. 3,345,317 to Hoashi et al. disclose that the aqueous dispersion polymerization process to prepare **PTFE** can be processed and stabilized with the presence of some inert and fluorinated compound such as **trifluorotrichloroethane, particularly 1,1,2-trifluoro-1,2,2-trichloroethane** (column 2, line 32-34; column 3, line 36-37). Although fluorinated emulsifier is used, **no claimed pre-emulsifying to aqueous microemulsion is disclosed**.

13. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Henry S. Hu whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the

organization where this application or proceeding is assigned is (703) 872-9306 for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

October 27, 2004

DAVID W. WU
SUPERVISORY PATENT EXAMINER